

## CLAIMS

103. A method for sterilizing an area comprising:

impregnating a paper sheet or pellet with a first chemical material, wherein the first chemical material is either an antimicrobial or biocidal chemical material, or is capable of reacting with a second chemical material to produce an antimicrobial or biocidal chemical material,

wherein, when the first chemical material is an antimicrobial or biocidal chemical material, said method further comprises placing the impregnated paper sheet or pellet in the area to be sterilized,

wherein, when the first chemical material is capable of reacting with a second chemical material to produce an antimicrobial or biocidal chemical material, said method further comprises:

(a) further impregnating the paper sheet or pellet with the second chemical material, thereby physically contacting and reacting the first and the second chemical materials, and

(b) placing the further impregnated paper sheet or pellet in the area to be sterilized,

wherein, when the first chemical material is an antimicrobial or biocidal chemical material, the first chemical material is selected from an alkali metal sorbate, a combination of an alkali metal sorbate and an acid, ascorbic acid, benzoic acid, hydrogen peroxide, lactic acid, d-limonene, phosphoric acid, a quaternary ammonium compound, sodium bisulfite, and sodium sulfite, and

wherein, the paper sheet or pellet is formed from at least one of softwood pulp, kenaf, flax and hemp.

104. The method of Claim 103, wherein the first chemical material is an antimicrobial chemical material which comprises an alkali metal sorbate.

105. The method of Claim 104, wherein the alkali metal sorbate is potassium sorbate.

106. The method of Claim 103, wherein the first chemical material is an antimicrobial or biocidal chemical material which comprises a combination of an alkali metal sorbate and an acid, wherein the acid is selected from acetic acid, ascorbic acid, benzoic acid, butyric acid, citric acid, glutaric acid, glycolic acid, lactic acid, pentanoic acid, phosphoric acid, propionic acid, and succinic acid.

107. The method of Claim 106, wherein the first chemical material comprises a combination of an alkali metal sorbate and citric acid.

108. The method of Claim 107, wherein the alkali metal sorbate is potassium sorbate.

109. The method of Claim 103, wherein the first chemical material is a biocidal chemical material which comprises hydrogen peroxide.

110. The method of Claim 103, wherein the first chemical material is a biocidal chemical material which comprises d-limonene.

111. The method of Claim 103, wherein the first chemical material is a biocidal chemical material which comprises phosphoric acid.

5 112. The method of Claim 103, wherein the first chemical material is capable of reacting with a second chemical material to produce a peracid.

113. The method of Claim 112, wherein the first chemical material is hydrogen peroxide, and wherein the second chemical material is an acid selected from acetic acid, ascorbic acid, butyric acid, citric acid, glycolic acid, and lactic acid.

10 114. The method of Claim 103, wherein the first chemical material is capable of reacting with a second chemical material to produce chlorine dioxide.

115. The method of Claim 114, wherein the first chemical material is a metal chlorite, and wherein the second chemical material is an acid selected from acetic acid, ascorbic acid, benzoic acid, butyric acid, citric acid, glutaric acid, glycolic acid, lactic acid, pentanoic acid, phosphoric acid, 15 propionic acid, and succinic acid.

116. The method of Claim 114, wherein the first chemical material is a metal chlorite, and wherein the second chemical material is a metal salt.

117. A paper product for use in sterilizing an area, which comprises:  
a paper sheet or pellet impregnated with a first chemical material, wherein the first 20 chemical material is an antimicrobial or biocidal chemical material selected from an alkali metal sorbate, a combination of an alkali metal sorbate and an acid, ascorbic acid, benzoic acid, hydrogen peroxide, lactic acid, d-limonene, phosphoric acid, a quaternary ammonium compound, sodium bisulfite, and sodium sulfite, and

wherein, the paper sheet or pellet is formed from at least one of softwood pulp, kenaf, 25 flax and hemp.

118. The paper product of Claim 117, wherein the first chemical material is an antimicrobial chemical material which comprises an alkali metal sorbate.

119. The paper product of Claim 118, wherein the alkali metal sorbate is potassium sorbate.

120. The paper product of Claim 117, wherein the first chemical material is an 30 antimicrobial or biocidal chemical material which comprises a combination of an alkali metal sorbate and an acid, wherein the acid is selected from acetic acid, ascorbic acid, benzoic acid, butyric acid, citric acid, glutaric acid, glycolic acid, lactic acid, pentanoic acid, phosphoric acid, propionic acid, and succinic acid.

121. The paper product of Claim 120, wherein the first chemical material comprises a combination of an alkali metal sorbate and citric acid.
122. The paper product of Claim 121, wherein the alkali metal sorbate is potassium sorbate.
- 5 123. The paper product of Claim 117, wherein the first chemical material is a biocidal chemical material which comprises hydrogen peroxide.
124. The paper product of Claim 117, wherein the first chemical material is a biocidal chemical material which comprises d-limonene.
125. The paper product of Claim 117, wherein the first chemical material is a biocidal  
10 chemical material which comprises phosphoric acid.
126. A paper product for use in sterilizing an area, which comprises:  
a paper sheet or pellet impregnated with a first and a second chemical material,  
wherein the first chemical material is capable of reacting with the second chemical material to  
produce an antimicrobial or biocidal chemical material,
- 15 wherein, the paper sheet or pellet is formed from at least one of softwood pulp, kenaf, flax and hemp.
127. The paper product of Claim 126, wherein the first chemical material is capable of reacting with the second chemical material to produce a peracid.
128. The paper product of Claim 127, wherein the first chemical material is hydrogen  
20 peroxide, and wherein the second chemical material is an acid selected from acetic acid, ascorbic acid, butyric acid, citric acid, glycolic acid, and lactic acid.
129. The paper product of Claim 126, wherein the first chemical material is capable of reacting with the second chemical material to produce chlorine dioxide.
130. The paper product of Claim 129, wherein the first chemical material is a metal  
25 chlorite, and wherein the second chemical material is an acid selected from acetic acid, ascorbic acid, benzoic acid, butyric acid, citric acid, glutaric acid, glycolic acid, lactic acid, pentanoic acid, phosphoric acid, propionic acid, and succinic acid.
131. The paper product of Claim 129, wherein the first chemical material is a metal chlorite, and wherein the second chemical material is a metal salt.

30